Antibacterial Activity of Bacillus pumilus SF1 Isolated from Lahijan' Forest Soil (Iran) Against Some Pathogenic Bacteria

Elmira Pourbaghi*[1]; Khosro Isazaded[2]; Masoumeh Anvari[3]; Leila Modiri[2]

1- Department of Microbiology andYoung Researchers Club, Lahijan Branch, Islamic Azad University of, Lahijan, Iran
2-Department of Microbiology, Lahijan Branch, Islamic Azad University, Lahijan, Iran
3- Department of Microbiology, Rasht Branch, Islamic Azad University, Rasht, Iran
elmira.pourbaghi@yahoo.com

Background & Objectives: Nowadays, the prevalence of antimicrobial resistance among key microbial pathogens is increasing at an alarming rate worldwide. Current solutions involve development of discover of new antimicrobials. Bacteria of the species *Bacillu spumilus* can produce biological compounds with antagonistic activity which are active against bacteria and fungi.This study was designed with the aim of isolation and screening of antibacterial production by *Bacillus pumilus* SF1 isolated from forest soil samples of Lahijan (Iran) against four human pathogenes (*Staphylococcus aureus* PTCC: 1113, *Salmonella typhimorium* PTCC: 1609, *Escherichia coli* PTCC:1533 and *Klebsiella pneumoniae* PTCC: 1402) and also optimization of various parameters for maximum antimicrobial production by isolated strain of *B. pumilus*.

Methods: Serial dilution agar plate technique and biochemical tests for isolation of B. pumilus species were used. In initial screening of antimicrobial activity against four human pathogenes, agar disk diffusion Methods and TSB medium is used. For production of antibacterial compounds, synthetic medium and agar well diffusion Methods is used. To obtain the maximum production of antibacterial compounds, different optimized parameters like pH (6-9), incubation period (0-72 hours) and glucose concentration (1-5%) are well considered on the basis of zone of inhibition. Finally, data were analyzed by SPSS and ANOVA tests.

Results: Maximum production of antimicrobial compounds by isolated strain of *B. pumilus* was observed after 48 hours of incubation at 37^{o}C, pH 7, 3% of glucose which was against *S.aureus*, *S.typhi, K. pneumonia and E.coli* on the basis of zone of inhibition respectively. We also found a significant relationship between change of glucose concentration of the culture media and external factors like pH and incubation period for more production of antimicrobial compounds.

Conclusion: Results of this study indicate the importance of *B. pumilus* species as a potential candidate for production of antibacterial compounds.

Keywords: *Bacillus pumilus*; Antibacterial Compounds